

Remarks

Applicants thank the Examiner for the careful examination of this application and the clear explanation of the rejections.

Claim 46, paragraph B. is amended to clarify a first broadcast antenna and a second broadcast antenna that are different from the receiving antenna. Space time transmit diversity is clarified in paragraph C. The term “filter circuitry” is plural and remains unchanged. Applicants are unable to locate: Claim 1, line 16: “space time...” should change to –space time...”.

Amended claim 46 obviates the rejections under 35 USC 112 and 103. The claims "particularly point out and distinctly claim the subject matter the applicant regards as his invention."

Claim 46 now requires that the data symbols are block space time encoded over a block size of at least four symbols.

The rejection depends mainly on the disclosure of Figure 5 of US6,317,411 to Whinnett. The Action specifies:

Encoded and Interleaved Traffic Channel Data Source 20 receiving a plurality of symbols.

Transformer 88 producing a plurality of symbols and a transform of the symbols.

Spreaders 92 using a spreading code W_1 to interpose a sequence of predetermined signals with the plurality of signals.

The first coded signal is applied to a first antenna.

The second coded signal is applied to a second antenna.

The text of the Whinnett patent, however, provides a different description of the circuit of Figure 5. See the text at column 5, lines 9-56.

Figure 5 depicts a system for transmitting signals from an antenna array using a transmit diversity technique. Data source 20 provides a data stream of symbols, which may be encoded and interleaved. These symbols, shown as S_1 through S_4 , are output at a rate determined by symbol clock 22.

The output of data source 20 is coupled to commutator 80, which, in this example, selects pairs of symbols that are output along branches 82 and 84 of the transmitter. Commutator 80 operates at one half of the rate of symbol clock 22, as shown by the output from divider 86. This means that the data rates along branches 82 and 84 are half the rate output from data source 20. Divider 86 divides by two because two symbols are selected for each branch. If any other number of symbols were selected for each branch, divider 86 would divide by the number of symbols selected.

Transformers 88 and 90 are coupled to the data streams output from commutator 80. Transformers 88 and 90 transform the pairs of symbols to produce two data streams that represent different mathematical combinations of the group of or symbols that was input into the transformer. The groups of symbols are transformed, or combined mathematically, in such a way that they may be mathematically separated in the receiver using the measured channel coefficients.

In a preferred embodiment, transformers 88 and 90 are implemented with space-time coders, such as a space-time coder 60 described with reference to Figure 3. In the example shown in Figure 5, space-time coders 88 and 90 each output first and second space-time encoded data streams, which are then coupled to the input of spreaders 92 in branch 82 and spreaders 94 in branch 84. Spreaders 92 use the same spreading code, which is shown in Figure 5 as the concatenation of W_1 with W_1 . Spreaders 94 use another spreading code formed by concatenating W_1 with the inverse of W_1 . The spreading codes selected for spreaders 92 and spreaders 94 are orthogonal to one another in the sense the signals in branches 82 and 84 may be separated from one another at the receiver.

The output of spreaders 92 and spreaders 94, which may be referred to as antenna data streams, are then modulated, up converted, amplified, and transmitted from a selected antenna element in an antenna array. The modulation and up conversion function are shown in Figure 5 at modulator and up converters 96. Amplification is performed by amplifiers 98, which are coupled to antennas 100 through 106.

The Whinnett patent thus provides no disclosure of any framing or time slots for data symbols, midamble symbols, or guard symbols. The Whinnett patent provides no disclosure of any data symbols being block space time encoded over a block size of at least four symbols.

The citations to the Whinnett patent in the rejection provide no explanation of receiver circuitry, filter circuitry operating to provide channel estimate output signals of a first broadcast antenna and a second broadcast

antenna in response to the midamble symbols, including the cyclic prefix, or space time transmit diversity decoder circuitry having inputs connected to the channel estimate output signals.

The citations to the Whinnett patent in the rejection have no reference to any aspects of receiver circuitry, only transmitter circuitry.

US 6,373,831 to Secord discloses only transmitting circuitry.

The Secord patent provides no disclosure of any framing or time slots for data symbols, midamble symbols, or guard symbols. The Secord patent provides no disclosure of any data symbols being block space time encoded over a block size of at least four symbols.

The citations to the Secord patent in the rejection provide no explanation of filter circuitry operating to provide channel estimate output signals of a first broadcast antenna and a second broadcast antenna in response to the midamble symbols, including the cyclic prefix, or space time transmit diversity decoder circuitry having inputs connected to the channel estimate output signals.

The Secord patent provides no disclosure of any framing or time slots for data symbols, midamble symbols, or guard symbols. The Whinnett patent provides no disclosure of any data symbols being block space time encoded over a block size of at least four symbols.

The citations to the Second patent in the rejection have no reference to any aspects of receiver circuitry, only transmitter circuitry. The Second patent thus fails to teach or disclose the particular limitations of claim 46.

The Action makes a vague, general reference to an IEEE 802.16 wideband wireless access system, but provides no citation to any particular publication. Applicant is unable to respond to the IEEE reference beyond relying on the specific, positively stated limitations of claim 46 as distinguishing over the cited art.

The rejection closes by saying that it would have been obvious to decide whether to transform or not plurality(sic) of symbols at second output terminal to provide additional time diversity.

Applicants are at a loss to respond to this conclusion, as the limitations of claim 46 are unrelated to deciding whether to transform a plurality of symbols.

Claim 46 stands allowable.

The application is in allowable form and the claims distinguish over the cited references. Applicants respectfully request reconsideration or further examination of this application.

Respectfully Submitted,

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